

Master's thesis (30 ECTS)

Working title: Modelling and characterization of photonic integrated circuits and related fundamental building blocks

In cooperation with: ams AG 

Objectives/Deliverables:

- Understanding the basic principles of photonic integrated design und related fundamental photonic building blocks (e.g. straight and bend waveguides, couplers, splitters, etc.)
- Description of the operating principle, theory, physics, device structure, and key design parameters of selected standard building blocks
- Optical measurement and analysis of available test wafers on photonic wafer prober and extraction of basic performance parameters (e.g. propagation losses). Comparison between simulated optical design and the measurement results.
- Automation of the photonic measurements and optical read-out (e.g. with Lab-View)
- Definition of additional relevant performance parameters for selected photonic building blocks (e.g. effective refractive index, group index, etc.)
- Design and photonic simulation of test structures dedicated for measurement of the selected performance parameter(s)
- Specification and description of the optical measurements required for the optical characterization measurements
- Optical measurement and analysis of the designed test structures. Comparison between simulated optical design and the measurement results. Extraction of the proposed design performance parameters and development of the corresponding compact model
- Documentation of the measurement results and update of the corresponding device data sheet format and building block library in the PDK.

Additional:

- First wafer material for hands-on measurements available
- Designed test chip will be manufactured on ams SiN waveguide technology
- Optical measurements at TU Graz

Graz University of Technology
Institute of Electrical Measurement and Sensor Systems

- Optical simulations at TU Graz

Organizational matters:

- Contractual partner: ams AG
- Duration: 6 months

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